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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SHORTSLE, KEVIN P	

ART UNIT	PAPER NUMBER
1734	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

MF-4

Office Action Summary	Application No.	Applicant(s)	
	09/941,476	WHITMAN, JOHN	
	Examiner	Art Unit	
	Kevin P. Shortsle	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *44-46,48 and 49* is/are allowed.

6)☒ Claim(s) *13-21,24-29,31-33,35-39,41,42,47 and 50-60* is/are rejected.

7)☒ Claim(s) *22,23,30,34,40,43 and 61* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *29 August 2001* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 38-39, 50-53, 55-56 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The percentages and ratios are defined as approximate values; this includes values above and below the values defined. The values above and/or below are new matter because there has not been a disclosure that defines the values defined as approximate (See spec. page 7, 3rd paragraph).

4. Claims 20-21, 41, 47, 52-57, 59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 20 recites the limitation "the third nozzle" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 21, it is unclear if the solvent is only recited to include diacetone alcohol or is just exemplary of the composition of the solvent. Claim 19 from which claim 21 depends requires both diacetone alcohol and aliphatic esther be apart of the solvent composition, while only diacetone alcohol is required by claim 21.

Claim 41 recites the limitation "the bulk solvent source" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 47, it is unclear what proper fluid pressure and level means. Such language is not defined to allow one in the art to ascertain the scope that proper fluid pressure and level comprises.

Claims 52-57 recite the limitation "the prewet solvent" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 59 recites the limitation "the nozzles" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 13, 15 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orth (USPN 5,750,317) in view of Gordon (USPN 5,066,616) and Yoda et al. (USPN 5,876,882). Orth discloses an apparatus comprising: a solvent dispense head in

fluid communication with a source of photoresist and solvent, a rotatable wafer-holding mechanism, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but does suggest other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions.

Orth is also silent to the source of solvent containing a solvent that includes diacetone alcohol. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not teach diacetone alcohol. One in the art would appreciate diacetone alcohol is a well known and conventional solvent used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34). It would have been obvious to one of ordinary skill in the art at the

time of the invention to supply diacetone alcohol to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Regarding claims 19 and 20, Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and solvent, a rotatable wafer-holding mechanism, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to dispense solvent and actuate the holding mechanism after the photoresist is dispensed and rotated, but does suggest other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions.

Orth is also silent to the source of solvent containing a solvent that includes diacetone alcohol and aliphatic esther. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not teach diacetone alcohol and aliphatic esther. One in the art would appreciate diacetone alcohol and aliphatic esther are well known and conventional solvents used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol and aliphatic esther as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34, 36, 39). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol and aliphatic esther to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol and aliphatic esther to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Regarding claims 15 and 16, Gordon discloses the claimed method steps (See Col. 3, lines 20 – 40).

Regarding claim 17, Orth discloses the claimed method steps (See Fig. 2).

Regarding claim 18, Gordon teaches the solvents are the same (See Col. 6, lines 43, 56).

7. Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied in paragraph 6 to claims 13 and 19 above, and further in

view of Hayes et al. (USPN 5,849,084). Orth discloses two nozzles, one for photoresist the other for solvent. One in the art would appreciate a second photoresist nozzle in order to provide proper coverage of the wafer, especially with the art generally moving to increase wafer dimensions. It is known and conventional to provide a third nozzle for the dispensing of photoresist as shown, for example, by Hayes et al. (See Col. 3, lines 35 – 40, 60 – 64 and Col. 6, lines 40 – 45). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide Orth with another photoresist nozzle in order to properly cover the entire surface of the wafer with photoresist.

8. Claims 24, 26 – 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orth in view of Gordon, Yoda et al. and Hayes et al. Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and solvent, a rotatable wafer-holding mechanism, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but does suggest other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of

ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions.

Orth is also silent to the source of solvent containing a solvent that includes diacetone alcohol. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not teach diacetone alcohol. One in the art would appreciate diacetone alcohol is a well known and conventional solvent used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Orth discloses two nozzles, one for photoresist the other for solvent. One in the art would appreciate a second photoresist nozzle in order to provide proper coverage of the wafer, especially with the art generally moving to increase wafer dimensions. It is known and conventional to provide a third nozzle for the dispensing of photoresist as shown, for example, by Hayes et al. (See Col. 3, lines 35 – 40, 60 – 64 and Col. 6, lines

40 – 45). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide Orth with another photoresist nozzle in order to properly cover the entire surface of the wafer with photoresist.

9. Claims 28 – 29, 31, 37, 41 – 42, 58 – 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orth in view of Gordon, Yoda et al. and Hasebe et al. (USPN 5,658,615). Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and solvent, a rotatable base, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but does suggest other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions.

Orth is also silent to the source of solvent containing a solvent that includes diacetone alcohol. Gordon teaches that the solvent distributed by the apparatus is the

same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not teach diacetone alcohol. One in the art would appreciate diacetone alcohol is a well known and conventional solvent used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Orth is also silent to solenoids that control the flow of photoresist and solvent. One in the art would appreciate solenoids are well known and conventionally employed to control the flows of liquid supply as shown, for example, by Hasebe et al. (See Col. 4, lines 42 – 47, Col. 5, lines 46 – 48, 58 – 61 and Col. 6, lines 6 – 14). It would have been obvious to one of ordinary skill in the art at the time of the invention to include solenoids in Orth to control the flows of the photoresist and solvent supplied to the discharge head.

Regarding claim 37, the references are applied for the same reasons set forth in the discussion of claim 28 above.

Regarding claim 42, Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and a bulk solvent, a rotatable

base, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but does suggest other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions.

Orth is also silent to the source of bulk solvent containing the bulk solvent that includes diacetone alcohol and aliphatic esther. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not teach diacetone alcohol and aliphatic esther. One in the art would appreciate diacetone alcohol and aliphatic esther are well known and conventional solvents used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol and aliphatic esther as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34, 36, 39). It would have been obvious to one of ordinary

skill in the art at the time of the invention to supply diacetone alcohol and aliphatic esther to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol and aliphatic esther to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Orth is also silent to solenoids that control the flow of photoresist and solvent. One in the art would appreciate solenoids are well known and conventionally employed to control the flows of liquid supply as shown, for example, by Hasebe et al. (See Col. 4, lines 42 – 47, Col. 5, lines 46 – 48, 58 – 61 and Col. 6, lines 6 – 14). It would have been obvious to one of ordinary skill in the art at the time of the invention to include solenoids in Orth to control the flows of the photoresist and solvent supplied to the discharge head.

Regarding claim 58, Orth discloses an apparatus comprising: a track coating unit coupled to a source of solvent having a solvent dispense head, a rotatable base, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface, and dispensing solvent on the edges and sides of the wafer for edge bead removal (See Figs. 2, 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but does suggest other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor

changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions.

Orth is also silent to the bulk solvent that includes diacetone alcohol. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not teach diacetone alcohol. One in the art would appreciate diacetone alcohol is a well known and conventional solvent used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Orth is silent to a bulk solvent container. One in the art would appreciate a container holds the solvent to be supplied to the solvent dispense head. It is well known

and conventional to provide a bulk solvent container as shown, for example, by Hasebe et al. (See Fig. 1, item 7b). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide Orth with a bulk solvent container as is well known and conventional in the art when supplying a solvent to a dispense head.

Regarding claim 59, Orth is also silent to solenoids that control the flow of photoresist and solvent. One in the art would appreciate solenoids are well known and conventionally employed to control the flows of liquid supply as shown, for example, by Hasebe et al. (See Col. 4, lines 42 – 47, Col. 5, lines 46 – 48, 58 – 61 and Col. 6, lines 6 – 14). It would have been obvious to one of ordinary skill in the art at the time of the invention to include solenoids in Orth to control the flows of the photoresist and solvent supplied to the discharge head.

Regarding claim 60, Yoda et al. teaches an aliphatic esther may also be used as the solvent with the diacetone alcohol (See Col. 7, lines 33 – 39).

Regarding claims 29 and 41, Gordon teaches the solvents are the same (See Col. 6, lines 43, 56).

Regarding claim 31, Orth discloses the claimed method steps (See Fig. 2).

10. Claims 32-33, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orth in view of Gordon, Yoda et al., Hayes et al. and Hasebe et al. Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and solvent, a rotatable wafer-holding mechanism, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See

Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but does suggest other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions.

Orth is also silent to the source of solvent containing a solvent that includes diacetone alcohol. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not teach diacetone alcohol. One in the art would appreciate diacetone alcohol is a well known and conventional solvent used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol to prepare the photoresist would

also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Orth discloses two nozzles, one for photoresist the other for solvent. One in the art would appreciate a second photoresist nozzle in order to provide proper coverage of the wafer, especially with the art generally moving to increase wafer dimensions. It is known and conventional to provide a third nozzle for the dispensing of photoresist as shown, for example, by Hayes et al. (See Col. 3, lines 35 – 40, 60 – 64 and Col. 6, lines 40 – 45). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide Orth with another photoresist nozzle in order to properly cover the entire surface of the wafer with photoresist.

Orth is also silent to solenoids that control the flow of photoresist and solvent. One in the art would appreciate solenoids are well known and conventionally employed to control the flows of liquid supply as shown, for example, by Hasebe et al. (See Col. 4, lines 42 – 47, Col. 5, lines 46 – 48, 58 – 61 and Col. 6, lines 6 – 14). It would have been obvious to one of ordinary skill in the art at the time of the invention to include solenoids in Orth to control the flows of the photoresist and solvent supplied to the discharge head.

11. Claims 25 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied in paragraph 8 to claim 24 above and the references applied in paragraph 10 to claim 32, and further in view of Ikeno et al. (USPN 4,886,012). Regarding claim 25, Orth is silent to the first and second nozzles in fluid

communication with the solvent source. One in the art would appreciate the increased flexibility of the nozzles having a dual function. It is known and conventional to connect nozzles to both a solvent source and photoresist source as shown, for example, by Ikeno et al. (See Figs. 3-4 and Col. 5, lines 10 – 68). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the first and second nozzles of Orth to be in fluid communication with the solvent source as shown by Ikeno in order to increase the flexibility and functionality of the apparatus.

Regarding claim 35, the prior art discloses that the solvent supplied and the solvent of the photoresist are the same, but does not teach that the source is from a common bulk solvent. One in the art would appreciate a common bulk solvent is used in order to simplify the apparatus. It is known and conventional to provide a single bulk solvent source as shown, by Ikeno et al. (See Fig. 3, items 18, 19). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a common bulk solvent to Orth in order to simplify the apparatus and decrease the amount of space required for the apparatus.

Allowable Subject Matter

12. Claims 44-46 and 48-49 are allowed.

13. Claims 22-23, 30, 34, 40, 43 and 61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. Claims 54 and 57 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: regarding claims 44 and 48, the prior art made of record fails to disclose or suggest a low pressure canister connected to a bulk solvent container and track coating unit. Regarding claims 22, 30, 34, the prior art made of record discloses the three nozzles directed in the claimed direction, however, the nozzles are not taught to be part of a single solvent head, instead a separate structure is provided for edge bead removal (See Doan USPN 5,952,050 and Rolfson USPN 6,114,252). Finally, claims 23, 40, 43, 54, 57 and 62 claim a range not taught or suggested in the prior art.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lehmann et al. (USPN 4,487,823) is cited to show that butyl acetate is an aliphatic ester (See Col. 5, lines 47 – 48).

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin P. Shortsle whose telephone number is 703-308-8193. The examiner can normally be reached on M-F, 8-4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard D. Crispino can be reached on 703-308-3853. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

K. P. Shortsle
January 14, 2002

RICHARD CRISPINO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700